

# Notice of Allowability

Application No.

10/657,870

Examiner

Bot LeDyhn

Applicant(s)

RITTER ET AL.

Art Unit

2862

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/23/05.
2. ☒ The allowed claim(s) is/are 1-53 and 91-93.
3. ☒ The drawings filed on 21 June 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
Bot LeDyhn  
Primary Examiner

### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

-After claim 33, insert the following claims 34-53:

SN: 10/657,870  
ART UNIT: 2862

Page 3

34

A system for use in a borehole for determining a resistivity parameter during drilling of a borehole in an earth formation comprising:

- (a) a bottom hole assembly (BHA) including
  - (i) a resistivity subassembly having a resistivity sensor with an offset from a wall of the borehole that is greater than a specified minimum value during rotation of the BHA;
  - (ii) an orientation sensor on said subassembly which makes a measurement of a toolface angle of said subassembly during continued rotation thereof; and
  - (iii) a device which maintains said resistivity sensor at said offset.
- (b) a processor which determines said resistivity parameter from

SN: 10/657,870  
AU: 2862

Page 4

measurements made by said resistivity sensor;

- (c) a device which drills said borehole; and
- (d) conveyance device which conveys said BHA into said borehole.

35. The system of claim 34 wherein said device for drilling said borehole comprises a drill bit.

36. ~~(withdrawn)~~ The system of claim 34 wherein said conveyance device comprises a drill string.

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37. ~~(withdrawn)~~ The system of claim 34 wherein said processor is part of said BHA.

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38. ~~(withdrawn)~~ The system of claim 34 wherein said processor includes a memory device which stores at least a subset of measurements made by said resistivity sensor.

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39. ~~(withdrawn)~~ The system of claim 34 wherein said resistivity sensor comprises a galvanic sensor.

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7/13/05

40. ~~(withdrawn)~~ The system of claim 39 wherein said sensor further comprises

- (i) a current electrode which conveys a measure current into said formation through a conducting fluid, and

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SN: 10/657, 870  
AU: 2862

Page 5

- (ii) at least one guard electrode proximate to said current electrode which maintains focusing of said measure current.
41. The system of claim 40 wherein said processor maintains a substantially constant power consumption by said electrodes.
42. The system of claim 34 wherein said orientation sensor comprises a magnetometer.
43. The system of claim 34 wherein said orientation sensor comprises an accelerometer.
44. The system of claim 34 wherein said device comprises a stabilizer.
45. The system of claim 34 wherein said device comprises a steerable rib.
46. The system of claim 34 wherein said borehole is filled with a substantially nonconducting fluid and wherein said resistivity sensor is capacitively coupled to said earth formation.
47. The system of claim 46 wherein said resistivity sensor makes

measurements at a plurality of different frequencies.

48. The system of claim 34 wherein said borehole includes a substantially non-conducting fluid therein and wherein said resistivity sensor conveys a measure current into said formation using capacitive coupling.
49. The system of claim 34 wherein said resistivity sensor further comprises a shielded dipole.
50. The system of claim 34 wherein said resistivity sensor further comprises a directionally sensitive induction logging tool.
51. The system of claim 50 wherein said directionally sensitive induction logging tool comprises a quadrupole transmitter.
52. The system of claim 34 wherein said resistivity sensor further comprises a radio frequency microwave transmitter
53. The system of claim 34 wherein said resistivity parameter comprises a resistivity image of said borehole.

### **EXAMINER'S COMMENT**

In Office Action dated 2/3/2005, claim 2 was erroneously indicated as allowable subject matter (i.e., galvanic sensor). In fact, Bitter discloses such a sensor. However, the claims are allowable because of the below reasons for allowance.

### ***Allowable Subject Matter***

Claims 1-53 and 91-93 are allowed.

### ***Examiner's Statement of Reasons for Allowance***

The following is an examiner's statement of reasons for allowance: The prior art of record does not, alone or in combination, disclose a device which maintains the resistivity sensor at an offset from the wall of the borehole that is greater than a specified minimum value.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Bot LeDinh whose telephone number is 5712722231. The examiner can normally be reached on Maxiflex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 5712722180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Application/Control Number: 10/657,870

Art Unit: 2862

Page <sup>8</sup> ~~4~~ <sup>13</sup>

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



BL/ 2005

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Primary Examiner